Institutional Status Review
580/Information Systems Center

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Advanced Data Management & Analysis Branch

March 22, 2001

AGENDA

- TECHNOLOGY HIGHLIGHTS
- PARTNERING
- OUTREACH
- INSTITUTIONAL STATUS
  - Papers, Conferences, and Seminars
  - Personnel
  - ISO 9000 QMS & CMM
  - Procurement
  - IT Security
  - Facilities
- GOOD NEWS

ISC Technology Highlights

Technology Activity/Project	Customer	Lead Code(s)	Major Accomplishments/Highlights/ Comments	Status			
				Tech Issues	Schedule Issues	Cost Issues	Staffing Issues
Internet Protocol (IP) in Space		580	• Several Code 580 members participated in the Peer Review Phase-II Summary Report that was completed				
Software Optimization and Reuse Technology (SORT) Program	300	581	• SORT Team and ISC met on February 14 - 15, 2001 to initiate the Spacecraft Trending Pilot • SORT Report to Congress is being worked directly with NASA HQ and Code 300				
Wallops Range Technology Upgrades	800	584	• Jay Pittman assisted in planning and design of new multi-mission control center activity, which will result in a unified launch, balloon, and spacecraft control center located at WFF. • EUVE control will be moved to WFF to demonstrate spacecraft control and the system will eventually serve as a backup to other control center systems • Jay Pittman supported design, specification, and purchase of components which will support a demonstration of re-entry/recovery capability for sounding rockets – The effort will support plans and proposals for allowing a demonstration of technology for Mars return/recovery activities				

Activity	Issue Code	Issue	Action

Legend: T=Technical; Sc=Schedule; C=Cost; S=Staffing

ISC Technology Highlights

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EO-1		584, 588	• Developed a scene tracking tool on the EO-1 website which allows the FOT, scientists/ instrumenters and data processing personnel to coordinate their activities in a more streamline manner. The tool became operational February 15, 2001				
Proposals		423, 586	• Robin Pfister, Jeanne Behnke, Dan Marinelli, and Mike Moore received funding from the Earth Science Technology office for a proposal entitled "Content-Based Metadata System: A Workbench to Prototype Data Mining Concepts"				
Standards	450	586	• GSFC Flight Test Experiment (FTE) on the British STRV Spacecraft has been terminated due to a receiver failure on the STRV 1c and 1d spacecraft • Development of CCSDS SCPS to TCP/IP space and ground gateways has been terminated due to a lack of funding.				

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ISC Technology Highlights

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JINI Object Information Network (JOIN)		588	• The JOIN project held a design review for the JOINed Digital Library (JDL) for Science Education.				
Instrument Remote Control (IRC)	Sophia/ HAWC	588	• The IRC project presented an overview of the project to Ron Polidan (PI of Kronos) and Pepper Hartley. Kronos is considering using IRC. • Lynne Case, of CommerceOne, presented the IRC architecture at the Ground System Architecture Workshop in El Segundo, California				
Onboard Studies		588	• The Aeroflex-Altair Finite State Control Engine experiment has successfully completed integration testing with the WIRE flight software maintenance group and operational readiness reviews with the FOT and WIRE testbed management. This newly developed flight software package has been successfully uplinked and tested on the WIRE Spacecraft.				

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ISC Partnering

- ISC and ESC co-hosted a Technology Tour for the Executive Council on "IP in Space" on Tuesday, February 20, 2001
  - A status update on the recent technology experiments and next steps for the "Operating Missions as Nodes on the Internet (OMNI)" and the FlatSat Testbed projects were presented in detail - Mary Kicza, John Hrastar, Mike Ryschkewitsch, Dennis Andrucyk & Shahid Habib were among the attendees
  - An important outcome was the action by Mary Kicza to draft language for possible inclusion in future NASA AOs to allow, but not necessarily require, IP protocols on spacecraft and in instruments (Most AOs include a standard boilerplate statement that the mission/instrument shall use NASA's CCSDS protocols)

ISC Partnering

- Development of the concept for the GSFC Evolving Mission Service Center (GEMSC) is maturing
  - GEMSC will operate selected GSFC missions, retain operations expertise for future mission challenges, and infuse technologies into operations and end-to-end mission support areas
  - Codes 580 & 450 met with Dr. John Campbell/400 to present concept
  - Potential Code 580 personnel have been identified to provide leadership and development expertise
  - Funding has not been identified - a mid-April presentation to NASA HQ(Codes S & Y) is planned

- John Catena & Mike Rackley/581 participated in the SOMO IAR at Johnson Space Center on March 1 - 2, 2001: Report to NASA HQ is on schedule for April

ISC Partnering

- Jay Pittman/584 initiated 3 new focus groups for 584W which will be open to all WFF organizations
  - Focus areas are ”Software Project Management and Estimation", “Algorithmic Analysis and Optimization”, and ”Software Development Tools and Environments”

- Jay Pittman/584 worked with the shuttle small payloads office on a proposal to develop a SEMposium - a web-based, interactive showcase of SEM projects (past, present, and future) in celebration of their 5th anniversary

- Steve Bailey/584 served as a red team member for CSCAPE proposal review on January 23, 2001

ISC Partnering

- Jay Pittman/584 assisted KSC/Spaceport Florida representatives with design of windweighting solution for upcoming Air Force launch

- Code 584 mentored a National Science Foundation (NSF) employee on a 60-day developmental assignment January 16, 2001 - March 23, 2001
  - Employee provided support to NGST and other internal branch efforts

- Steve Kempler/586 presented "Earth Science Enterprise's Distributed Active Archive Centers (DAACs)" to HQ's Mike Thomas/YO that described applications, outreach, and education activities that support the Earth Science Enterprise accomplishments and investments

ISC Partnering

- Ben Kobler/586 is leading a DATSG with representation from all directorates and in conjunction with the GSFC CIO to
  - Define GSFC's 5-year data storage requirements
  - Perform cost trade-offs for various alternative solutions
  - Develop a Center Strategic plan for data storage
  - Develop a set of recommendations

- Jeff Lubelczyk/586 visited JPL and met with Rob Sherwood and Russel Knight to discuss the ASPEN/CASPER scheduling engine (related to the Goal Oriented Commanding (GOC))
  - Provided insight into the functionality ASPEN/CASPER and its application to the constellation environment
  - Developed an MOU to define the working relationship
  - JPL was positive on having their work used in an operational environment at GSFC (Terra Solid State Recorder management tool) and want to review the ASPEN model once complete

ISC Partnering

- Susan Olden, Howard Dew, Bill North, Yun-chi Lu, Steve Kempler/586 & Quinton Barker/585 participated in the EOSDIS DAAC Managers Quarterly at the Global Hydrology Resource Center (GHRC), Huntsville, AL

- Ken McDonald/586 participated in a Digital Earth Environment Study Team working session with the other team members at JPL February 12-13, 2001

- David Matusow and Julie Breed/588 met with Dr. Scott Acton, a professor at the University of Virginia, to discuss and refine a proposal he is planning to submit to NASA to extend the Image2000 tool

ISC Partnering

- Code 588 hosted several local Universities at the first Code 588 University Day Workshop on February 1, 2001
  - The purpose of this day was to exchange information with the hope of creating partnerships for existing research projects and/or for development of new research proposals

ISC Outreach

- Howard Kea/581 attended the National Convention of the National Society of Black Engineers in Indianapolis, IN, on March 14 - 15, 2001 as a recruiter for AETD
- Jay Pitman/584 provided a tour of WFF engineering activities to a group of Virginia Engineering professors/instructors
- Dan Mandl/584 judged a science fair at Hyattsville Middle School on February 23, 2001
- Steve Naus & Chris Durachka/585 judged a Science Fair at St. John's Elementary School in Severna Park, MD on March 7, 2001
- Elizabeth Brinker & Mary Reph/586 attended the GSFC Education Summit to obtain more ideas on how we can participate effectively in NASA's educational outreach

ISC Outreach

- Joy Henegar, Steve Kempler, Matt Schwaller/586, & Kelly Jeletic/585 participated in New DISS/NPP retreat March 6-7, 2001
- Jeanne Behnke/586 sponsored one-day training on the use of tools to search, order, visualize and manipulate HDF-EOS data collected from the EOS Terra Satellite at the EOS Investigator Working Group (IWG) Meeting in Fort Lauderdale, FL
  - EOS Data Gateway (EDG) for data search and order
  - Command Line HDF-EOS Utilities
  - Several examples of HDF-EOS data manipulation and visualization
- Jeanne Behnke, Elizabeth Brinker, Karen Michael/586 & Jim Byrnes/587 judged a Science Fair at Glenn Dale Elementary School on March 7, 2001

ISC Outreach

- Jim Byrnes/587 is mentoring the BotBall 2001 Team at the Holy Trinity Middle School in Glenn Dale, MD - this robotics program promotes hands-on learning in Science, Technology, Engineering, and Math

ISC Institutional Status

- Papers, Conferences, and Seminars
  - Mike Rackley/581 participated in a meeting of the Space Domain Task Force of the OMG in Irvine, CA on February 26 – 28, 2001
  - John Catena/581 presented "Ground Data System Risk Mitigation Techniques for Faster, Better, Cheaper Missions" at the IEEE Aerospace Conference in Big Sky, MT on March 10, 2001
  - Sally Godfrey/583 & Linda Rosenberg/300 gave a presentation to Directors of Code 300, 400, 500 and 700 on the NASA Software Working Group and the NASA/GSFC Software Improvement Initiative
  - Sally Godfrey/583 attended the Software Engineering Process Group (SEPG) Conference & tutorials in New Orleans the week of March 12, 2001

ISC Institutional Status

- Papers, Conferences, and Seminars (Continued)
  - Steve Bailey/584 completed final neural network analysis for his co-authored, peer reviewed paper, this work was a continuation of work begun over a year ago to develop satellite altimeter models for surface wind speed retrieval using ocean satellite crossovers
  - Jeff Smith/585 presented, “A new approach to Spacecraft Checkout Using National and International High Performance Research and Education Networks(HPRENs)”, at the Internet2/NLANR/APAN Joint Tech's Workshop in Honolulu, HI, January 29, 2001
  - Clayton Sigman/585 presented the ESDIS security approach and NPG 2810 at the ADEOS II Security Workshop, March 12-16/2001 at JPL

ISC Institutional Status

- Papers, Conferences, and Seminars (Continued)
  - Robin Pfister/586 presented a paper titled, "The Information Management System(IMS) of NASA's EOS Data and Information System" at the AMS Conference in Albuquerque, MN, January 15-18, 2001
    - The presentation included an EOS Data Gateway (EDG) demonstration
  - Jeanne Behnke, Rich Ullman/586 & Karen Moe/700 coordinated an ESTO/ESDIS XML Workshop where various attendees presented their work on XML DTDs, XML Schema, parsers, conversion tools, processes, testing, lessons learned, etc.

ISC Institutional Status

- Personnel
  - Open Positions
    - Code 581
      - Associate Branch Head
      - HST Ground Operations Senior Engineer
      - HST Lead Engineer
    - Code 582
      - Associate Branch Head (2)

ISC Institutional Status

- Personnel (Continued)
  - GSFC Departures
    - Karen Keadle-Calvert/584 left for a position in industry, February 16, 2001
    - Joe Vitale/582 left for a position in industry, January 26, 2001
  - Transfers within GSFC
    - Jay Sigrist joined Code 581 as an HST Ground Systems Engineer from the IV&V Facility on March 12, 2001
  - New Hires/Conversions
    - None

ISC Institutional Status

➢ 01 Personnel Summary to Date

- FY01 Personnel Losses: 11
  - Outside GSFC: 7 Within GSFC: 4
- FY01 Gains
  - Hire Actions Completed: 6
  - Hire Actions in Progress: 4
  - Hire Names Identified: 7
  - Total: 17

Current FTE Status: 298 FTE Targets - FY01: 299 FY02: 304 FY 03: 289

ISC Institutional Status

- ISO 9000 QMS & CMM
  - Reviewed various versions of new software GPGs and NPGs
- Procurement
  - NPP is looking for SEB members (including chair) for its upcoming Science Data Segment Acquisition
- IT Security
  - Code 584 has completed all corrective actions from a security incident in December and the incident is closed

ISC Institutional Status

- Facilities
  - Jay Pittman/584 is the AETD representative to the WFF Facilities replanning committee which is evaluating rehousing options
    - The current plan is to develop a new WFF Science and Engineering Facility in 2004-2005 which will be a new building to house AETD and Code 900 personnel, offices, and labs
  - Reviewing the physical security posture of all Code 580 labs

ISC Good News

- Debbie Sharpe/585 IFM Agency Brio Pilot Project System went into production on February 20, 2001 - supporting 100 users from across the Agency

ISC Top Issues

- SOMO Funding
  - Recent SOMO SOCB action resulted in a budget cut of $2.3M FY01 funds (out of a total of $5.6M)
    - Impacts affect current and future mission support areas and seriously erode core CS mission services software competencies
    - Stop work orders will need to be executed by the end of May 2001 in order to recover expected funds return to SOMO
  - Software Engineering Laboratory (SEL) FY01 funding cut 60%, FY02 funding said to be zero

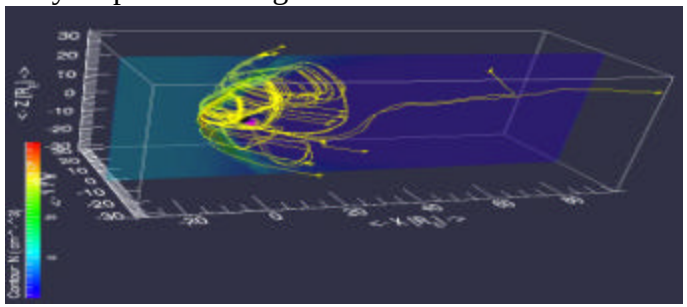
- Hire Freeze
  - Freeze continues to dim prospects for hiring fresh-out graduates, NEX candidates, and effect organizational transfers

Space Weather View (SWV) Aids CCMC Scientists

Space Weather View (SWV) is a newly developed object-oriented visualization tool that uses IDL object graphics to visualize in 3D output from space weather models. Currently SWV displays output from BATS-R-US, the first model selected for study by the Community Coordinated Modeling Center (CCMC). BATS-R-US is global 3D adaptive MHD model developed at the University of Michigan. The output from BATS-R-US is pre-processed onto a regular grid and quantized to byte data before being displayed using SWV. In the future, SWV will be enhanced to display output from other space weather models studied by the CCMC.

SWV is an interactive program providing great flexibility and usability. The user can intuitively rotate, scale or translate the view volume by dragging the mouse in the draw window. The user can view an entire volume, an isosurface, vectors, flow lines, and up to three contour-planes at a time. The contour-planes can be moved by dragging a slider. In addition, the user can view the same view parameters at different time steps by using the animation features of SWV.

The screenshot of SWV (on the front) is from a simulation run by CCMC scientists of the July 15, 2000 space weather event using data from GEOTAIL. The yellow magnetic field lines indicate a southward IMF. The closed magnetic field lines in the inner magnetosphere are magenta; the half-open cusp magnetic field lines are blue. SWV's animation features enable CCMC scientists to analyze the changes in magnetic field topology during substorms. A meridonal cut through the density (N) distribution is also shown using a partially transparent contour-plane. The plasma velocity (V) is indicated with 200 white arrows randomly dispersed through out the volume.



The SWV image (left) is from simulation conducted by CCMC scientists to study the effect of a sudden increase in solar wind dynamic pressure using a density pulse. The flow lines show the electric current distribution and enable CCMC scientists to trace the currents entering the ionosphere back to their origin in the magnetosphere.

Acronyms

ADEOS II	-	**Advanced Earth Observation Satellite**
AETD	-	**Applied Engineering and Technology Directorate**
AMS	-	**American Meteorological Society**
AO	-	**Administrative Officer**
APAN	-	**Asian Pacific Advance Networking**
ASPEN	-	**Automated Scheduling and Planning Environment**
CASPER	-	**Continuous Activity Scheduling Planning Execution and Replanning**
CCSDS	-	**Consultative Committee for Space Data Systems**
CIO	-	**Chief Information Officer**
CMM	-	**Capability Maturity Model**
CSCAPE	-	**Clouds Subvisible Cirrus and Particles Experiment**
DAAC	-	**Distributed Active Archive Centers**
DATSG	-	**Disk and Tape Study Group**
DISS	-	**Data & Information Systems and Services**
DTD	-	**Document Type Definition**
EDG	-	**EOS Data Gateway**
EO-1	-	**Earth Observing Satellite-1**
EOS	-	**Earth Observation System**
EOSDIS	-	**Earth Observation System Data and Information System**
ESC	-	**Electrical Systems Center**
ESDIS	-	**Earth Sciences Data and Information System**
ESTO	-	**Earth Sciences Technology Office**
EUVE	-	**Extreme Ultraviolet Explorer**
FOT	-	**Flight Operations Team**
FTE	-	**Flight Test Experiment**
	-	**Full-Time Employee**

Acronyms

FY	-	**Fiscal Year**
GEMSC	-	**GSFC Evolving Mission Services Center**
GHRC	-	**Global Hydrology Resource Center**
GOC	-	**Goal Oriented Commanding**
GPG	-	**Goddard Procedures and Guidelines**
GSFC	-	**Goddard Space Flight Center**
HAWC	-	**High-resolution Airborne Wideband Camera**
HDF	-	**Hierarchical Data Format**
HPREN	-	**High Performance Research and Education Networks**
HQ	-	**Headquarters**
HST	-	**Hubble Space Telescope**
HSTOMS	-	**Hubble Space Telescope Operations Management System**
IAR	-	**Independent Annual Review**
IEEE	-	**The Institute of Electrical and Electronics Engineers, Inc.**
IFM	-	**Integrated Financial Management**
IMS	-	**Information Management System**
IP	-	**Internet Protocol**
IRC	-	**Instrument Remote Control**
ISC	-	**Information Systems Center**
ISO	-	**International Organization for Standardization**
IT	-	**Information Technology**
IV&V	-	**Independent Validation & Verification**
IWG	-	**Investigator Working Group**
JDL	-	**Joined Digital Library**
JOIN	-	**JINI Object Information Network**
JPL	-	**Jet Propulsion Laboratory**
KSC	-	**Kennedy Space Center**
MOU	-	**Memorandum of Understanding**

Acronyms

NASA	-	National Aeronautics and Space Administration
NEX	-	NASA Excepted Term Hire
NGST	-	Next Generation Space Telescope
NLANR	-	National Laboratory for Applied Network Research
NPG	-	NASA Procedures and Guidelines
		National Polar-Orbiting Operational Environment Satellite System(NPOESS)
NPP	-	NPOESS Preparatory Project
NSF	-	National Science Foundation
OMG	-	Object Management Group
OMNI	-	Operating Missions as Nodes on the Internet
PI	-	Principal Investigator
QMS	-	Quality Management System
SCPS	-	Space Communications Protocol Standard
SEB	-	Source Evaluation Board
SEL	-	Software Engineering Laboratory
SEM	-	Space Experiment Module
SEPG	-	Software Engineering Process Group
SMEX	-	Small Explorer
SOCB	-	Space Operations Control Board
SOMO	-	Space Operation Management Office
SORT	-	Software Optimization and Reuse Technology
STRV	-	Space Technology Research Vehicle
TCP	-	Transmission Control Protocol
WIRE	-	Wide-Field Infrared Explorer
WFF	-	Wallops Flight Facility
XML	-	Extensible Markup Language